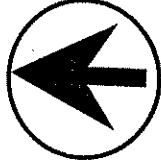


Date : 7/29/02

Count Number : TMC0218

Location : CSAH 9 (Round Lake Blvd)

@ CSAH 20 / 161st Ave.



North

CSAH 9

10570

#2

5111	461	T
4592		E
58		D

5459

CSAH 20

591	2906
182	
2133	

#3

5685

2779

412

#1

875

463	C
85	B
216	A
162	

161st Ave.

CSAH 9

6887

#4

13944

172	M
4783	L
2102	K
7057	

LANES OF APPROACH

	RIGHT TURN LANE	LEFT TURN LANE	THRU LANES	TOTAL
#1	0	0	1	1
#2	0	0	1	1
#3	1	0	1	2
#4	1	0	1	2

Anoka County Highway Department

Traffic Volume and Turning

Movement Study

Anoka County Highway Department
Traffic Engineering

Weather: HOT, Humid
Counter TDC-8
Counted by: Melissa/Jessica

Traffic Volume and Turning Movement Stud

File Name : TMC 0218
Site Code : 02180102
Start Date : 07/29/2002
Page No : 1

Groups Printed- 1 - Unshifted

Start Time	CSAH 9 Southbound					CSAH 20 Westbound					CSAH 9 Northbound					161ST AVE Eastbound					Exclu Total	Inclu. Total	Int. Total
	Left	Thru	Rig ht	Hea vy	App. Total	Left	Thru	Rig ht	Hea vy	App. Total	Left	Thru	Rig ht	Hea vy	App. Total	Left	Thru	Rig ht	Hea vy	App. Total			
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0				
06:00	9	115	1	3	125	44	0	2	0	46	0	15	10	3	25	1	1	4	0	6			
06:15	10	131	0	2	141	48	3	4	2	55	0	26	20	1	46	0	2	7	1	9			
06:30	13	161	1	2	175	61	1	4	3	66	2	21	14	0	37	3	3	4	0	10			
06:45	19	137	0	2	156	47	1	3	2	51	0	26	15	3	41	0	8	1	1	9			
Total	51	544	2	9	597	200	5	13	7	218	2	88	59	7	149	4	14	16	2	34			
07:00	14	140	1	5	155	50	2	5	6	57	2	21	26	5	49	1	2	5	1	8			
07:15	13	128	0	5	141	58	1	6	6	65	0	29	28	9	57	0	6	7	0	13			
07:30	14	129	1	7	144	45	0	4	4	49	0	29	14	6	43	0	4	5	0	9			
07:45	8	146	0	7	154	78	3	4	2	85	1	35	26	9	62	0	3	4	0	7			
Total	49	543	2	24	594	231	6	19	18	256	3	114	94	29	211	1	15	21	1	37			
08:00	16	119	2	8	137	37	2	7	4	46	1	26	15	6	42	1	2	3	0	6			
08:15	13	91	0	4	104	45	0	5	3	50	1	31	28	9	60	2	3	6	1	11			
08:30	8	94	0	1	102	34	1	4	4	39	0	23	21	5	44	0	1	0	0	1			
08:45	15	101	0	6	116	41	2	5	4	48	1	27	28	8	56	0	1	2	0	3			
Total	52	405	2	19	459	157	5	21	15	183	3	107	92	28	202	3	7	11	1	21			
09:00	11	84	0	9	95	39	3	5	3	47	0	21	19	2	40	0	0	3	0	3			
09:15	4	63	0	1	67	27	0	8	5	35	3	34	19	4	56	2	1	4	0	7			
09:30	3	71	0	1	74	23	1	8	2	32	0	39	18	6	57	0	3	4	0	7			
09:45	3	84	0	2	87	25	1	5	2	31	3	29	23	1	55	2	0	2	0	4			
Total	21	302	0	13	323	114	5	26	12	145	6	123	79	13	208	4	4	13	0	21			
10:00	8	73	1	6	82	34	1	8	5	43	0	53	20	9	73	1	1	3	0	5			
10:15	4	84	0	3	88	33	3	10	4	46	0	41	21	1	62	0	0	4	0	4			
10:30	2	65	1	1	68	26	2	11	7	39	0	51	23	7	74	0	1	3	0	4			
10:45	4	58	4	1	66	16	2	8	3	26	1	49	20	4	70	0	2	3	0	5			
Total	18	280	6	11	304	109	8	37	19	154	1	194	84	21	279	1	4	13	0	18			
11:00	3	52	2	5	57	25	3	9	5	37	0	49	21	5	70	0	4	1	2	5			
11:15	5	49	1	7	55	27	1	4	5	32	2	63	42	7	107	3	1	0	0	4			
11:30	3	67	2	5	72	35	4	9	4	48	2	59	32	4	93	1	4	3	0	8			
11:45	2	43	0	2	45	42	1	10	6	53	2	61	34	4	97	2	2	3	1	7			
Total	13	211	5	19	229	129	9	32	20	170	6	232	129	20	367	6	11	7	3	24			
12:00	1	63	3	2	67	47	6	11	7	64	3	57	32	7	92	8	3	6	0	17			
12:15	2	65	1	3	68	35	1	9	5	45	2	63	35	5	100	0	4	4	1	8			
12:30	1	63	2	2	66	41	2	8	4	51	3	58	33	3	94	1	1	2	0	4			
12:45	3	47	0	5	50	29	3	6	5	38	1	55	27	6	83	2	2	3	1	7			
Total	7	238	6	12	251	152	12	34	21	198	9	233	127	21	369	11	10	15	2	36			
13:00	2	49	1	4	52	35	2	5	6	42	0	48	25	4	73	3	1	2	0	6			
13:15	6	50	3	6	59	33	4	8	3	45	1	44	33	4	78	2	3	4	2	9			
13:30	4	58	2	7	64	29	5	11	3	45	2	53	35	3	90	5	1	0	1	6			
13:45	2	52	0	5	54	31	4	8	4	43	2	59	32	6	93	1	3	0	1	4			
Total	14	209	6	22	229	128	15	32	16	175	5	204	125	17	334	11	8	6	4	25			
14:00	4	56	2	6	62	26	7	14	3	47	5	67	28	8	100	0	5	0	0	5			
14:15	9	76	0	6	85	38	2	10	3	50	3	82	33	5	118	0	3	2	1	5			
14:30	10	69	0	2	79	34	1	18	3	53	2	88	27	3	117	0	3	1	0	4			
14:45	9	47	2	0	58	38	6	10	5	54	2	94	35	3	131	2	2	2	2	6			
Total	32	248	4	14	284	136	16	52	14	204	12	331	123	19	466	2	13	5	3	20			
15:00	9	62	0	4	71	30	3	14	4	47	2	94	42	0	138	1	1	1	0	3			
15:15	8	73	2	5	83	23	2	15	3	40	7	127	56	3	190	1	3	4	0	8			
15:30	7	61	2	7	70	29	4	13	2	46	4	116	44	6	164	0	7	3	1	10			
15:45	2	62	2	3	66	24	5	15	3	44	6	145	36	4	187	0	5	2	0	7			
Total	26	258	6	19	290	106	14	57	12	177	19	482	178	13	679	2	16	10	1	28			
16:00	12	63	1	3	76	29	4	12	6	45	5	158	46	4	209	0	4	1	1	5			
16:15	4	72	1	7	77	28	5	14	4	47	4	137	54	6	195	3	7	2	0	12			
16:30	4	46	0	0	50	23	1	18	1	42	5	131	44	7	180	5	5	0	1	10			
16:45	10	61	3	4	74	27	7	13	1	47	8	147	56	6	211	6	8	1	0	15			
Total	30	242	5	14	277	107	17	57	12	181	22	573	200	23	795	14	24	4	2	42			
17:00	11	61	2	1	74	35	2	12	2	49	5	165	50	4	220	3	7	2	1	12			
17:15	8	72	2	3	82	35	5	20	3	60	4	140	51	2	195	3	10	5	2	18			
17:30	9	61	1	0	71	47	4	19	2	70	3	110	47	3	160	2	8	1	1	11			
17:45	8	65	0	4	73	31	5	14	2	50	3	159	62	4	224	4	7	3	0	14			
Total	36	259	5	8	300	148	16	65	9	229	15	574	210	13	799	12	32	11	4	55			

Anoka County Highway Department
Traffic Engineering

Weather: HOT, Humid
Counter TDC-8
Counted by: Melissa/Jessica

Traffic Volume and Turning Movement Stud

File Name : TMC 0218
Site Code : 02180102
Start Date : 07/29/2002
Page No : 2

Groups Printed- 1 - Unshifted

Start Time	CSAH 9 Southbound					CSAH 20 Westbound					CSAH 9 Northbound					161ST AVE Eastbound					Exclu Total	Inclu Total	Int. Total			
	Left	Thru	Right	Heavy	App. Total	Left	Thru	Right	Heavy	App. Total	Left	Thru	Right	Heavy	App. Total	Left	Thru	Right	Heavy	App. Total						
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0							
18:00	8	77	0	1	85	34	5	18	3	57	3	145	47	4	195	1	5	0	0	6	8	343	351			
18:15	10	66	1	1	77	26	3	19	2	48	4	162	53	6	219	3	7	4	2	14	11	358	369			
18:30	8	94	2	4	104	32	4	10	2	46	11	120	39	5	170	0	7	1	1	8	12	328	340			
18:45	8	60	0	2	68	37	6	9	5	52	3	108	34	9	145	0	5	4	1	9	17	274	291			
Total	34	297	3	8	334	129	18	56	12	203	21	535	173	24	729	4	24	9	4	37	48	1303	1351			
19:00	12	48	1	2	61	29	4	9	3	42	4	95	28	4	127	1	4	3	0	8	9	238	247			
19:15	8	61	1	3	70	35	1	7	1	43	3	77	22	3	102	3	5	3	0	11	7	226	233			
19:30	3	46	0	0	49	16	3	6	0	25	7	108	32	1	147	0	0	1	1	1	2	222	224			
19:45	6	48	1	2	55	28	8	5	1	41	3	87	31	2	121	0	1	1	0	2	5	219	224			
Total	29	203	3	7	235	108	16	27	5	151	17	367	113	10	497	4	10	8	1	22	23	905	928			
20:00	8	50	0	0	58	22	2	6	0	30	6	60	33	1	99	3	6	0	0	9	1	196	197			
20:15	9	41	1	1	51	35	3	9	1	47	4	91	40	2	135	0	6	6	1	12	5	245	250			
20:30	3	49	0	3	52	19	2	13	0	34	4	86	54	1	144	1	3	2	0	6	4	236	240			
20:45	8	48	1	0	57	23	1	8	1	32	3	83	48	2	134	0	2	1	0	3	3	226	229			
Total	28	188	2	4	218	99	8	36	2	143	17	320	175	6	512	4	17	9	1	30	13	903	916			
21:00	4	45	0	2	49	25	5	8	3	38	5	78	43	1	126	1	4	1	0	6	6	219	225			
21:15	6	47	1	1	54	18	2	7	1	27	4	80	35	1	119	0	2	0	0	2	3	202	205			
21:30	8	38	0	0	46	19	3	7	2	29	2	75	31	0	108	1	0	2	0	3	2	186	188			
21:45	3	35	0	1	38	18	2	5	0	25	3	73	32	0	108	0	1	1	0	2	1	173	174			
Total	21	165	1	4	187	80	12	27	6	119	14	306	141	2	461	2	7	4	0	13	12	780	792			
Grand Total	461	459	58	207	5111	213	182	591	200	2906	172	478	210	266	7057	85	216	162	29	463	702	1553	1623			
Approch %	9.0	89.8	1.1			73.4	6.3	20.3			2.4	67.8	29.8			18.4	46.7	35.0								
Total %	3.0	29.6	0.4		32.9	13.7	1.2	3.8		18.7	1.1	30.8	13.5		45.4	0.5	1.4	1.0		3.0	4.3	95.7				

Multiway Stop Warrant Analysis
TMC 0218 CSAH 9 @ CSAH 20 / 161st AVE
Speed Limit of Major Roadway..... 55

Minimum Traffic Volumes Multiway Stop Warrant Criteria:

- a) The total vehicular volume entering the intersection from all approaches must average at least 500 vehicles per hour (vph) for any 8 hours of an average day, AND:
- b) The combined vehicular and pedestrian volume from the minor street or highway must average at least 200 vph for the same 8 hours, with an average delay to minor street vehicular traffic of at least 30 seconds per vehicle during the maximum hour, BUT:
- c) When the 85-percentile approach speed of the major street traffic exceeds 40 miles per hour, the minimum volume warrant is 70% of the above requirements.

Hour	Total Vehicular Traffic Entering the Intersection	Vehicular Traffic Entering on First Minor Roadway	Vehicular Traffic Entering on Second Minor Roadway	Sum of Minor Approaches	Is Stop Warrant Met?
6 AM - 7 AM	998	218	34	252	YES
7 AM - 8 AM	1098	256	37	293	YES
8 AM - 9 AM	865	183	21	204	YES
9 AM - 10 AM	697	145	21	166	YES
10 AM - 11 AM	755	154	18	172	YES
11 AM - 12 PM	790	170	24	194	YES
12 PM - 13 PM	854	198	36	234	YES
1 PM - 2 PM	763	175	25	200	YES
2 PM - 3 PM	974	204	20	224	YES
3 PM - 4 PM	1174	177	28	205	YES
4 PM - 5 PM	1295	181	42	223	YES
5 PM - 6 PM	1383	229	55	284	YES
6 PM - 7 PM	1303	203	37	240	YES
7 PM - 8 PM	905	151	22	173	YES
8 PM - 9 PM	903	143	30	173	YES
9 PM - 10 PM	780	119	13	132	NO

TOTAL HOURS MET: 15

MULTIWAY STOP WARRANT IS MET

or Street Approaches:

Northbound:

CSAH 9

Data File: C:\Program Files\PC-Warrants\TMC0218.war
 Count Type: IMC. Channel: 0. Count Date: 7/29/ 2
 Number of Lanes: 2
 Approach Speed: 55
 Total Approach Traffic: 7057

Southbound:

CSAH 9

Data File: C:\Program Files\PC-Warrants\TMC0218.war
 Count Type: IMC. Channel: 0. Count Date: 7/29/ 2
 Number of Lanes: 1
 Approach Speed: 55
 Total Approach Traffic: 5111

Minor Street Approaches:

Eastbound:

161ST AVE

Data File: C:\Program Files\PC-Warrants\TMC0218.war
 Count Type: IMC. Channel: 0. Count Date: 7/29/ 2
 Number of Lanes: 1
 Approach Speed: 30
 Total Approach Traffic: 463

Westbound:

CSAH 20

Data File: C:\Program Files\PC-Warrants\TMC0218.war
 Count Type: IMC. Channel: 0. Count Date: 7/29/ 2
 Number of Lanes: 2
 Approach Speed: 55
 Total Approach Traffic: 2906

Analysis of 8-Hour Volume Warrants (Criteria refers to high volume side street for that hour):

Hour	Main	Side		Rank	Warrant 1	Warrant 2	Warrant 8
Begin	(Total)	Vol.	Dir.		Meets? Criteria	Meets? Criteria	Meets? Criteria
0	0	0	W	17	140	70	112
1	0	0	W	18	140	70	112
2	0	0	W	19	140	70	112
3	0	0	W	20	140	70	112
4	0	0	W	21	140	70	112
5	0	0	W	22	140	70	112
6	746	218	W	3	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
7	805	256	W	1	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
8	661	183	W	7	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
9	531	145	W	14	--BOTH-- 140	SIDE 70	--BOTH-- 112
10	583	154	W	12	--BOTH-- 140	SIDE 70	--BOTH-- 112
11	596	170	W	11	--BOTH-- 140	SIDE 70	--BOTH-- 112
12	620	198	W	6	--BOTH-- 140	SIDE 70	--BOTH-- 112
13	563	175	W	10	--BOTH-- 140	SIDE 70	--BOTH-- 112
14	750	204	W	4	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
15	969	177	W	9	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
16	1072	181	W	8	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
17	1099	229	W	2	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
18	1063	203	W	5	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
19	732	151	W	13	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
20	730	143	W	15	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
21	648	119	W	16	MAIN 140	--BOTH-- 70	--BOTH-- 112
22	0	0	W	23	140	70	112
23	0	0	W	24	140	70	112

Warrant Summary:

Rural values apply.

Warrant 1 - Minimum Vehicular Volumes

SATISFIED for 15 hours. Criteria--Main St.: 420; Side St.: See Volume Summary.

Warrant 2 - Interruption of Continuous Traffic

SATISFIED for 11 hours. Criteria--Main St.: 630; Side St.: See Volume Summary.

Warrant 3 - Minimum Pedestrian Volumes

NOT SATISFIED. Ped volumes too low. Criteria--190 Peds in peak hour, 100 peds in 4th high hour.

Warrant 4 - School Crossing

NOT APPLICABLE. Gap data has not been defined.

Warrant 5 - Progressive Movement

NOT SATISFIED. Adjacent signals closer than 1000 feet and/or not part of coordinated system.

Warrant 6 - Accident Experience

NOT SATISFIED. 0 correctable accidents is fewer than required 5.

Correctable Accidents: 0; Right Angle Accidents: 0; Left Turn Accidents: 0; Other Accidents: 0.

Warrant 7 - Systems Warrant

NOT SATISFIED. At least one street has no major approaches. Peak hour total entering volume: 1383.

- Approaches which are part of the principal through traffic roadway network.
- Approaches which include rural or suburban highways outside, entering or traversing a city.
- Approaches which appear as a major route in an official transportation plan.

Warrant 8 - Combination of Warrants

SATISFIED for 16 hours. Criteria--Main: 504; Side: See Volume Summary.

Warrant 9 - Four Hour Volumes

SATISFIED for 11 hours.

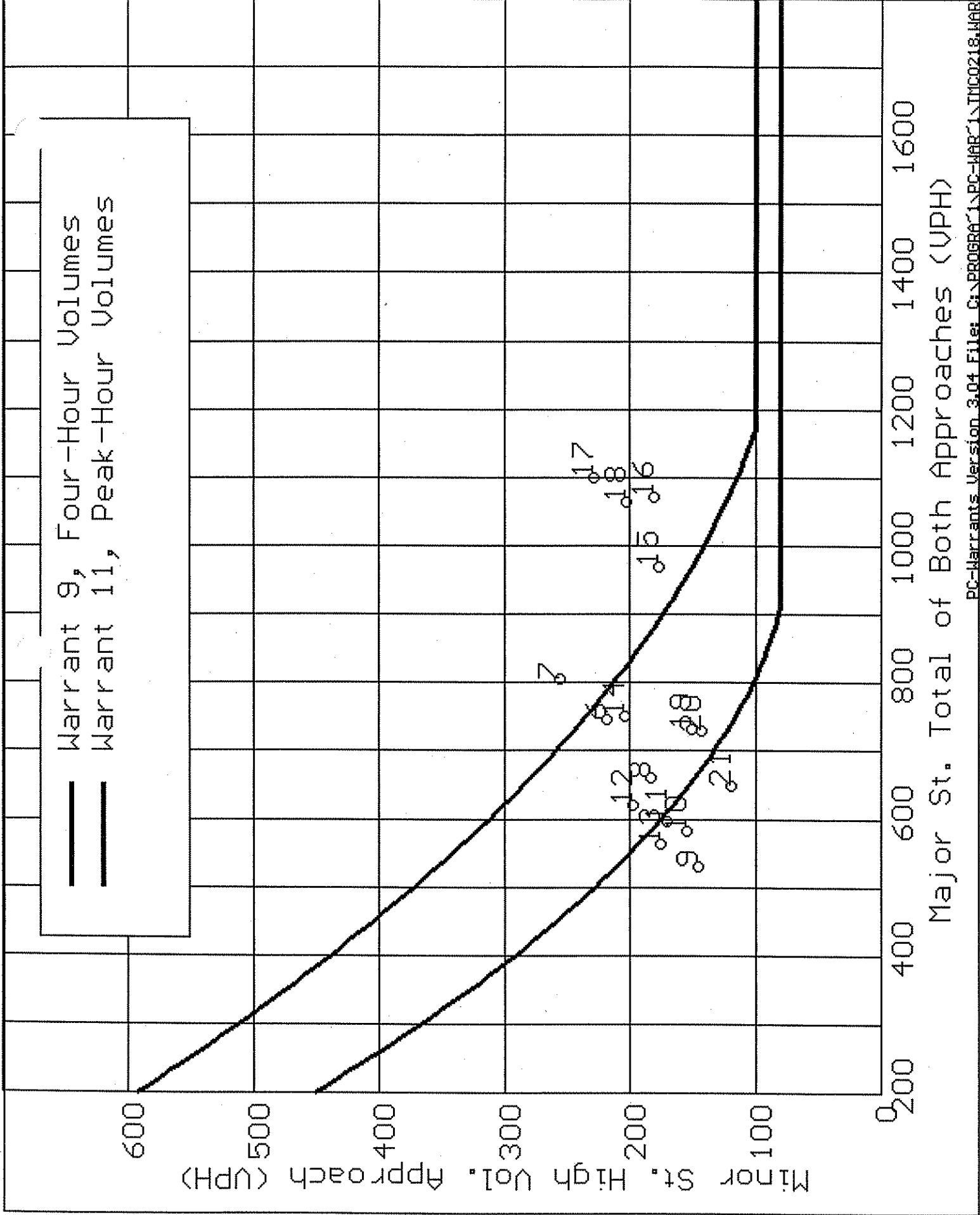
Warrant 10 - Peak Hour Delay

NOT APPLICABLE. Volume requirements satisfied, but side street peak hour delay not defined.

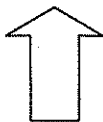
Criteria--Main St.: 800 (4 approaches), 650 (3 approaches); Side St.: 150.

Warrant 11 - Peak Hour Volume

SATISFIED for 5 hours.



Major St. Total of Both Approaches (UPH)



NORTH

COUNT LOCATION:

CSAH 9 (ROUND LAKE BLVD) @

DATE:

7/29/02

CSAH 20 / 161ST AVE

APP. #1 = 161ST AVE

APP. #2 = CSAH 9

APP. #3 = CSAH 20

APP. #4 = CSAH 9

APP. #2

APP. #1

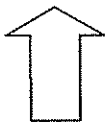
APP. #3

APP. #4

HEAVY VEHICLE- ANY VEHICLE HAVING MORE THAN FOUR TIRES TOUCHING THE PAVEMENT

- A. TRUCKS- A HEAVY VEHICLE INVOLVED PRIMARILY IN THE TRANSPORT OF GOODS OR IN THE DELIVERY OF A SERVICE.
- B. RV- A HEAVY VEHICLE OPERATED BY A PRIVATE MOTORIST AND INVOLVED IN THE TRANSPORT OF RECREATIONAL EQUIPMENT OR FACILITIES.
- C. BUSES- A HEAVY VEHICLE INVOLVED IN THE TRANSPORTATION OF GROUPS OF PEOPLE.

TIME	PEDESTRIANS					HEAVY VEHICLES		
	APP. #1	APP. #2	APP. #3	APP. #4	15 MIN TOT	TRUCKS	RV	BUS
6:00-6:15AM						6		
6:15-6:30						6		
6:30-6:45						4		1
6:45-7:00						9		
HOURLY TOTAL						HOURLY TOTAL		26
7:00-7:15						15		2
7:15-7:30						15		5
7:30-7:45						14		3
7:45-8:00						18		
HOURLY TOTAL						HOURLY TOTAL		72
8:00-8:15		1			1	17		
8:15-8:30						12		5
8:30-8:45						10		2
8:45-9:00						16	1	1
HOURLY TOTAL					1	HOURLY TOTAL		64
9:00-9:15						14		
9:15-9:30						11		
9:30-9:45						9		
9:45-10:00						5		
HOURLY TOTAL						HOURLY TOTAL		39
10:00-10:15						21		
10:15-10:30						8		
10:30-10:45						13	1	1
10:45-11:00						7		1
HOURLY TOTAL						HOURLY TOTAL		52
11:00-11:15				1	1	17		1
11:15-11:30						17	1	1
11:30-11:45						12		1
11:45-12:00						12		1
HOURLY TOTAL					1	HOURLY TOTAL		63
12:00-12:15						16		14
12:15-12:30						13		
12:30-12:45						10		
12:45-1:00						18		
HOURLY TOTAL						HOURLY TOTAL		71
1:00-1:15						15		
1:15-1:30						14		
1:30-1:45						13		
1:45-2:00						15		
HOURLY TOTAL						HOURLY TOTAL		57



NORTH

COUNT LOCATION:

CSAH 9 (ROUND LAKE BLVD) @

DATE:

7/29/02

CSAH 20 / 161ST AVE

APP. #1 = 161ST AVE

APP. #2 = CSAH 9

APP. #3 = CSAH 20

APP. #4 = CSAH 9

APP. #2

APP. #1

APP. #3

APP. #4

HEAVY VEHICLE- ANY VEHICLE HAVING MORE THAN FOUR TIRES TOUCHING THE PAVEMENT

- A. TRUCKS- A HEAVY VEHICLE INVOLVED PRIMARILY IN THE TRANSPORT OF GOODS OR IN THE DELIVERY OF A SERVICE.
- B. RV- A HEAVY VEHICLE OPERATED BY A PRIVATE MOTORIST AND INVOLVED IN THE TRANSPORT OF RECREATIONAL EQUIPMENT OR FACILITIES.
- C. BUSES- A HEAVY VEHICLE INVOLVED IN THE TRANSPORTATION OF GROUPS OF PEOPLE.

TIME	PEDESTRIANS					HEAVY VEHICLES		
	APP. #1	APP. #2	APP. #3	APP. #4	15 MIN TOT	TRUCKS	RV	BUS
2:00-2:15PM	1				1	15		1
2:15-2:30			1		1	14		
2:30-2:45		1			1	8		
2:45-3:00						11		
HOURLY TOTAL					3	HOURLY TOTAL		49
3:00-3:15						8		
3:15-3:30						12		
3:30-3:45						13	2	
3:45-4:00		2			2	9	1	
HOURLY TOTAL					2	HOURLY TOTAL		45
4:00-4:15						13		1
4:15-4:30						15		
4:30-4:45						9		
4:45-5:00						11		
HOURLY TOTAL						HOURLY TOTAL		49
5:00-5:15						8		
5:15-5:30						9	1	
5:30-5:45		1			1	6		
5:45-6:00						10		
HOURLY TOTAL					1	HOURLY TOTAL		34
6:00-6:15			1		1	7		
6:15-6:30						10		1
6:30-6:45						12		
6:45-7:00						17		
HOURLY TOTAL					1	HOURLY TOTAL		47
7:00-7:15						8	1	
7:15-7:30						7		
7:30-7:45						2		
7:45-8:00			1		1	6	1	
HOURLY TOTAL					1	HOURLY TOTAL		25
8:00-8:15	1				1	1		
8:15-8:30			3		3	5		
8:30-8:45						4		
8:45-9:00						3		
HOURLY TOTAL					4	HOURLY TOTAL		13
9:00-9:15						6		
9:15-9:30						3		
9:30-9:45						2		
9:45-10:00						1		
HOURLY TOTAL						HOURLY TOTAL		12